



ACHIM SZEPANSKI 2024-08-18

QUANTUM THEORY AND THE OBJECT – GABRIEL CARTEN VS. JEAN BAUDRILLARD

GENERICSCIENCE BAUDRILLARD, OBJECT, OPERATOR, PLOTNITSKY, QUANTUM
THEORY

Gabriel Carten describes quantum physics as a theory of objects. Such a theory consists firstly of a general formalism (mechanics) for the treatment of every kind of physical object. Secondly, there are various special types of objects (particles, fields, molecules, waves, astro-physical systems, etc.) that can be treated with the help of this general formalism. Carten defines quantum physics as a formal ontology of general physical objects; it is a formalization of the structure of the (non-transcendental) generic object = X. The object is a physical configuration characterized by a set of objective properties that allow virtual observers to recognize the object despite the variations of its phases. The relationships between the

invariant objective properties of the object and the phenomenological diversity of its phases in relation to synthetic operations need to be investigated. In quantum mechanics, the object generates the synthetic operations that unify its different phases. The constitutive capacities are transferred from the subject to the object.

For Carten, the object is a kind of projector of phases whose whatness is given by a persistent core of invariant objective properties. There are two types of transformations that can be performed on an object, namely objective transformations, which transform the object into another object, and phase transformations, which designate the different phases of the object without changing it objectively. Objectivity means invariance, that is, the auto-morphisms of the object are induced by the objective properties of the object itself. Each objective property defines a specific type of phase transformation. The ingression of a universal operator into an object defines what could be called the self-operator of the object.

For Cartel, there are the invariant objective properties and the set, which indicates how the object participates in a certain number of universal ideas. The first postulate of the quantum theory of physical objects unites these two ways of defining the whatness of an object. A transformation produced by one of the object's self-operators is not an objective transformation of the object into another object, but a phase transformation that does not change the whatness of the object. This means that the self-operators of an object contain all possible phantasmatic transformations of the object into itself. The self-operators unfold the transformations that, without changing the whatness of the object, allow the observation of the different phases of the object. One could therefore say that the self-operators of an object are the generators of its phenomenological representation. The invariant property of the object generates its appearances. On the one hand, the identification of an object requires an invariant eidetic core. On the other hand, the appearance of an object requires phantasmatic acts, phase transformations that enable the observation of its different phases without having an objective effect.

Quantum mechanics establishes a link between essence and appearance by stating that the eidos of an object is the trigger of its phantasmatic acts. Objective properties thus fulfill two conditions, namely they are invariant under all phase transformations of the object, and they induce a certain kind of phase transformations of the object. If a certain property is modified by phase transformations that are in turn induced by an objective property belonging to the eidos of the object, then the former property cannot also be an objective property of the same object. This statement can be seen as the conceptual translation of Heisenberg's uncertainty principle. It is possible to show that momentum p is a property that induces the transformations of position q (and vice versa). Thus, if momentum p is an objective property in the eidos of the object, then position q cannot also be an objective property of the same object. Rather, the position q is a phase of the object that changes when the phase transformations of p act on the object. Since the position q and the momentum p are incommensurable, they cannot both be objective properties of the same object. (Ibid.: 487)

The quantum theory of objects shows that the counting of the phenomenological manifold of the phases of the object is given by the eidos of the object itself. Thus, the function of

synthesis is anchored in the eidetic core that defines the whatness of the object. More precisely, the self-synthesis of an object is performed by its self-operators. Each self-operator generates a kind of automorphism of the object, a particular sequence of non-trivial transformations of the object into itself. Each sequence of automorphisms connects the different phases belonging to the same phase orbit. In turn, the self-operators are defined by the objective properties that constitute the eidos of the object. In this way, the eidos simultaneously defines the synthetic functions that guarantee the objective coherence of the phenomenological multiplicity of the aspects of the object.

Thus, the objective consistency of the manifold of experimental intuition is not noetically determined by the transcendental subject (or the experimental context), but by the eternal objects of nature. (Ibid.: 499) For Cartel, quantum mechanics provides a realistic and complete description of physical objects. The fact that the position q and the momentum p cannot both be objective properties of the same object at the same time does not mean that the whatness of the object depends on the subject of observation, the measuring device or the experiment, but that it is no longer necessary to invoke a transcendental argument to explain why it is not possible to have access to all the objective information that defines an object. If momentum p is an objective property of an object, then position q is necessarily a phase with no objective value. Consequently, the classical description of physical objects, which includes both q and p , is overdetermined.

Baudrillard has a different position. For Baudrillard, the reciprocal positions of subject and object disappear at the experimental interface, although for him this is also where the final state of uncertainty and indeterminacy arises in relation to the reality of the object – but, Baudrillard asks, why not also the indeterminacy in relation to the subject? Michel Serres argues similarly, for whom the position of the subject, immersed in the objective flows of matter, is not marked by the subject's perception, but by its primary objecthood (its soul as a material body).

For Baudrillard, the distinction between subject and object is generally only conceivable as a fiction, which, moreover, can only be maintained in the human zone of perception, but which completely collapses at the level of extreme phenomena and microscopic phenomena. Baudrillard writes that far too much has been said about the alteration of the object by the subject in observation, but almost no one has addressed the question of the alteration of the subject by the object. (Ibid.: 90) The main interest has always been in the conditions under which the subject discovers the object, see Žižek, but the conditions under which the object discovers the subject have not been explored at all. What is interesting for Baudrillard, however, are precisely the situations and experiments in which the object slips away from the subject, eludes it, becomes paradoxical and ambiguous and thus infects the subject and its analytical concept with ambiguity. So if it were the object to which creative power must also be attributed, then, according to Baudrillard, we would not only be dealing with Heisenberg's principle of indeterminacy, but also with the notorious principle of reversibility. Until now, however, reversibility between subject and object has remained a metaphysical assertion. One can no longer make at least the relation between subject and object a mental a priori

(Žižek) without missing the object, but neither can one reduce the relation to the object if reversibility is to be indicated. Reversibility requires a middle ground that is not an exchange, but is only revealed in a social process of material-discursive practices (acting reference to things and thinking).

For Baudrillard, the scientific object, like the stars, is light years away, but reappears as a trace on the screens. (Ibid.) Quantum theory must at least establish that the object no longer exists as a unity and solidity – it is always two in its cosmological dimension. It disappears under certain circumstances, it escapes, it has no definitive status, it appears only in the form of ephemeral and aleatory traces on the screens of virtualization. At its outer edge, the sciences can only detect the disappearance of the object as such, or, as Baudrillard says, they can only verify the way in which the object plays with its own objectivity. This is the perverse strategy of the object; perhaps it is even a form of revenge. Apparently, for Baudrillard, the object is a kind of deceiver that thwarts all the subjectivized protocols of the experiment, so that even the subject still loses its position as subject. However, Baudrillard also qualifies: “I won’t transform the object into a supersubject. But it would seem that something has escaped us. Definitely. This is not because our science and technologies are not advanced enough; on the contrary. The closer we come, through experimentation, to the object, the more it steals away from us and finally becomes undecidable. And do not ask where it has gone. Simply, the object is what escapes the subject – more we cannot say, since our position is still that of the subject and of rational discourse” (Baudrillard 2000b: 96). For Baudrillard, the fact that we cannot simultaneously determine the speed and position of a particle is part of the illusion of the object and its eternal play. The displacement of the subject by the object culminates in Baudrillard’s demand for a radically new form of theory. (Baudrillard 1996: 92) For Baudrillard, the object corresponds more to an antagonistic principle of the universe that does not bow to the dialectical consensus and the syntheses of reason. In this respect, it can be understood as evil or unpredictable from the perspective of the subject. Baudrillard writes about his view of objects: “Beyond the final principle of the subject rises the fatal reversibility of the object, the pure object: the pure event (the fatal), the object mass (the silence), the fetish object, the object femininity (the seduction)” (Baudrillard 1991: 86).

On the basis of entropic and negentropic processes on several levels, which form loops in their co-genesis with technologies and quasi-objects, the indeterminacy of the object and the subject (as intersubjectivity) emerges. This raises the question of whether the concepts of subject and object can still be used at all in quantum theory. [1] If the question is whether an object can have such contradictory properties as being wave-like at one time and particle-like at another, quantum experiments bear witness to the realization that “wave-like” and “particle-like” may not even be ascribed as attributes to quantum objects, for these, together with attributes such as momentum and velocity, still remain those objects of classical concepts that are used to explain the radically new phenomena of quantum physics. What is at stake is the visibility of quantum objects, which classical physics took for granted, raising the question of whether quantum objects can still be called “objects” at all, which in turn means that physics is now confronted with the unthinkable, which is only observable or visible in its effects. As Plotnitsky writes, the invisible objects of quantum phenomena are effects that are

only accessible to us in their effects. (Plotnitsky 1994: 12) And in quantum theory, it is possibilities and not objects that produce effects.

The discovery of quarks, for example, shows in and with elementary particle physics that it is the structures that produce effects without having to be realized as objects in space and time, which means that they cannot be presented as independent objects. The phenomenon of superfluidity also shows that two individuated objects can form a pair that levels out object properties, leading to collectivization in an overarching quantum state. In the case of superconductivity, the particles do not disappear, but dissolve into nested transformation processes in which electrons lose their individuality in the interaction with the environment, but merge into Cooper pairs, which in turn integrate them into overlapping waves. (Vogd 2014: 197) At this time, Heisenberg already clearly saw that the basis of reality is not formed by particles, but by structures that can be captured in a mathematical form. So if one no longer prefers the subject, then the belief in cause and effect between the phenomena that we call things also disappears. The problem of quantum theory, which increasingly tends to take on an ontological status, is to be able to offer physically consistent concepts that can be translated into real arrangements of experiments, on the one hand, and to serve a highly abstract formalization qua mathematics, on the other, whereby the epistemological and ontological status of the wave function remains open. Theory or method and experimental development can deal with diverse problems without further ado, whereby one can proceed in a certain agnostic way, insofar as a universal world concept is missing or simply not necessary.

[1] If one now even questions the objecthood of quantum objects – which are only conceivable as effects and only observable in their effects – this necessarily also applies to the concept of causality. Classical physics, which works according to the principle of causality, primarily requires the construction of a model with which the interactions between natural objects and natural phenomena can be observed, measured, theorized, explained and verified. Causality is defined here by the assertion that the state X of a physical system is determined definitively (and not with a probability unequal to one) at all future points in time according to a law. Causality is conceived here as a temporal asymmetric relationship of before and after. The arrow of causation (from cause to effect) is a consequence of the thermodynamic arrow (from lower to higher entropy). However, the relationship between the two arrows is related both to the existence of irreversible phenomena and to the temporal orientation of each agent involved in the concept of causation. It is intertwined with the epistemic arrow of time (we know the past better than the future) and the agential arrow of time (we can act in the future but not in the past).

In physics today, however, laws are expressed as regularities that describe correlations between natural phenomena in particular. Laws make no distinction between past and future: the future determines the past in exactly the same way that the past determines the future. There is no temporal orientation. This way of understanding physical laws has been defined

as determinism, which is ontological but allows us to avoid the concept of cause. However, if quantum physics can only describe the correlation of observations, then the concept of relationship also becomes questionable, with the differential equations only allowing probabilities for possible future experiments based on previously conducted experiments, which implies a (local) arrow of time. Each measurement event that has actually occurred determines which events may or may not occur in the future and can be predicted with one probability or another, which is not equivalent to saying that any of these events will occur. The event, A, at time t_0 , defines possible future events. No future state of the system under consideration is definitely determined.

Since quantum mechanics can only describe the interaction between the effects and the measuring instruments, it is no longer possible to construct such a model. At this point, Bohr's concept of complementarity gains further significance for Plotnitsky, as it confirms the disappearance of certain models by pointing to the impossibility of obtaining an overall picture of quantum phenomena due to the mutually exclusive character – wave and particle – of the quantum objects. The wave effect or the particle effect of the “objects” may be fully visible and definable depending on the experimental set-up, but each experimental set-up involves only a partial definition of the effects, and so the whole phenomena can never be visualized in terms of a single model and should therefore always be thought of in a complementary relationship.

All this requires a revision not only of causality and visualization, but also, as Bohr writes, of our attitude towards the problem of physical reality. Again, as Plotnitsky writes, classical physics or Newtonian mechanics can be interpreted as realistic because it wants to be seen as a complete description of all the (independent) physical properties of its objects necessary to explain their behavior. In contrast to these classical, causal and deterministic model constructions, however, quantum phenomena have proven that such a model concept no longer works, because in quantum physics the self-evident – physical reality as such – is at stake.

[← PREVIOUS](#) [NEXT →](#)

META

[CONTACT](#)

[FORCE-INC/MILLE PLATEAUX](#)

[IMPRESSUM](#)

[DATENSCHUTZERKLÄRUNG](#)

TAXONOMY

[CATEGORIES](#)

[TAGS](#)

[AUTHORS](#)

[ALL INPUT](#)

SOCIAL

FACEBOOK

INSTAGRAM

TWITTER